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GENERALIZED
VASO-MOTOR PARALYSIS

OF THE
SUPERIOR EXTREMITIES.

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SUPERIOR EXTREMITIES.

The study of clinical characteristics has preceded, in the case of most diseases, the physiological researches, which furnish more or less accurately the rational explanation of their causes. It has been otherwise as regards those morbid phenomena which are assigned to the action of the nerves that preside over the functions of the blood-vessels. Experimental physiology, which, in 1727, under the auspices of Pourfour du Petit, went in advance of pathological observation into a new channel, indicated the course of certain vascular troubles before these phenomena had attracted the

particular attention of clinical students. Nevertheless, though many experiments have followed in long succession, though the most eminent physiologists have multiplied acquisitions of science in relation to this subject, it seems reserved to pathology to deliver final judgment on the theories propounded, after weighing well the facts, and bringing out those distinguishing characters which nothing can differentiate in so delicate a manner as disease itself.

Hence it is that a peculiar interest should pertain to those clinical observations which happen to test the theories of physiologists, and as the cases which have been recorded are yet but few in number, and as diseases of this kind are not a little obscure, it is most important to note all the signs which may clearly fix their boundaries and indicate the path of scientific progress.

The recent observations of Dr. Maurice Raynaud* on Local Asphyxia of the Extremities, present pathological facts of considerable interest, and which appear to fall in with the theoretical explanation deduced from physiological experiments. It is well known that when we divide the sympathetic nerve, there are produced phenomena of vascularization and of calorification in corresponding parts of the body, which disappear when we galvanize the peripheral end of the separated nerve. Then the vessels contract again, and the heat diminishes. It should, however, be remembered that diminution of the temperature may be the result of other causes than the action of the sympathetic. Thus: first, if we sever the fifth pair, hyperæmia of the conjunctiva will follow, and yet there will be a decrease of temperature; second, if we tie the veins of a rabbit's ears, the

* Raynaud.—Nonvelles recherches sur la nature et le traitement du l' asphyxie locale des extrémités. Archives General de Médecine Janvier, 1874.

small branches dilate, and there is stasis of the blood, whilst the ears become cold.

In these cases, according to the elegant experiments of M. Claude Bernard,* a notable augmentation of temperature follows on the section of the sympathetic nerve.

It is different, however, with respect to the phenomena of decreased temperature and ischæmia, produced by ligation of the arteries.

Now, in the cases observed by Dr. Raynaud; "the extremities," he remarks, "become the seat of decreased temperature, accompanied by cyanosis, lividity, and by sensations more or less painful." Afterwards, in the more serious cases, gangrenous spots make their appearance. The disease affects a symmetrical form, and these accidents may be intermittent. He believes that these phenomena must be attributed to a vice of vaso-motor innervation, and that the symmetrical form of the lesions has for cause an excitement proceeding from the center of the spinal cord.

His hypothesis asserts the existence of a vascular spasm in the ultimate ramifications of the blood-vessels, varying from simple diminution of calibre to complete closure. With this closure we should have a bloodless and cadaveric condition of the part, whereas "the minute arteries alone being closed, and the smaller veins open, we should have venous stasis produced, whence the cyanosis and livid aspect which we see in a majority of cases."

This hypothesis offers some difficulties. We know it is true, from the experiments of M. Brown-Sequard,† that irritation of the vaso-motor nerves produces partial ischæmia, abatement of temperature, pallor, and a marked lowering of the vital activity. But we must not forget that in diseases

* Claude Bernard.—*Leçons sur la physiologie et la pathologie du système nerveux*.

† Brown-Sequard—*Course of lectures, etc.*, page 147, 1860.

of this kind very important lesions have been found by Professor Charcot, who writes, "As to the instances of spontaneous gangrene which have been connected with a vascular spasm, they should not have, judging from my own observations, the significance which has been accorded them, because in all cases of this kind which I have happened to encounter I have found the caliber of the vessels either diminished by a morbid alteration of the arterial walls, or obstructed by a thrombus."*

Diminution of temperature is likewise found in scleroderma,† in which we may believe the caliber of the minute vessels of the skin is decreased, because of the morbid production of much finely granular matter in the meshes of the connective tissue. This would give rise to pressure from without. Indeed, according to Rassmussen, an infiltration of small cells into the vascular sheaths constitutes the principal point of the histological alterations.

These instances go to prove that local mechanical causes may of themselves alone be sufficient to account for the phenomena described by Dr. Raynaud, without involving central irritation of the spinal cord. In fact, when we recall the experiments of M. Waller, who has observed hyperæmia to follow quickly on ischæmia because of the exhaustion of nervous energy, we should be tempted to conclude against the existence of a continued spasm (in non-hysterical cases) were it not that M. O. Weber asserts that he has succeeded in producing a constant irritation for nearly a week of the cervical sympathetic, marked by a decrease of temperature

* Charcot—*Leçons sur les Maladies du System Nerveux*, recueillies par Bourneville, 1872-73, p. 126.

† Professor Ball has recently (March, 1874) communicated to the *Société de Biologie* a most interesting case of scleroderma, in which the decreasing temperature was well shown.

to the extent of 2° centigrade (or $3\frac{1}{2}^{\circ}$ F'). Even then, however, there arose no troubles of nutrition. It should be added that Dr. Raynaud cites, in support of his hypothesis, certain unusual pulsations in the central vein of the retina, and partial spasmodic constrictions of the arteries of that region, which have been occasionally met with in the cases of local asphyxia collated by him.

The following case, that of a patient whom Dr. Duchenne (de Boulogne) submitted to my examination, requesting me to put on record my opinions—in which he concurred—offers a direct confirmation of some remarkable facts demonstrated by experimental physiology, and which may, it is hoped, serve to clear up some points which have been hitherto obscure.

History.—C., aged fifty years, a copper trimmer, is a man of robust constitution and florid complexion, who has hitherto enjoyed excellent health. He has had neither cough nor colic, nor any of the symptoms usually assigned to copper poisoning, whether the heart, the respiratory or the digestive organs be considered. The hands, which are in an abnormal condition, present no lesion except the cicatrix of an old whitlow on the left forefinger. He came to be treated for impotence, and that, at first, was all he complained of; but other phenomena were soon discovered, some of which were traced back several years. By careful questioning the following facts were elicited:

In 1872 he was aware of weakness in the arms and legs, but most especially in the knees. This sensation, however, neither became localized nor remained constant; it seemed to flit through all his members. In 1873 he noticed it to predominate in the left knee. This uneasy sensation, which caused no pain and was transient, seemed to ascend along the leg from the calf to the thigh, and the proof that it was not merely a subjective sensation lies in the fact that the

weakness of the leg increased so much at times that he was obliged to sit down. He usually recovered, however, in a few minutes, and was able to go about his work as before. No aggravation of his symptoms occurred when he walked out; on the contrary, the exercise did him good, and after a brisk walk of half an hour he felt a marked sensation of pleasurable ease. The disorder, as we see, was intermittent, showing itself after intervals of comparative health.

In January last, however, he was attacked in a more enduring manner in both upper and lower extremities, the sensation of debility being greatest in the left arm and right leg. So much was he enfeebled, that whereas when formerly attacked he could lift a weight of two or three pounds, he became at this time unable even to keep his forearm flexed upon the arm. He preserved the power of flexion, but not the power of maintaining it; for in a few seconds the forearm would fall of its own weight. At this stage the muscular force of the hands, tested by the dynamometer of Dr. Duchenne (de Boulogne), was equivalent, on an average, to 43 kilogrammes, or 94.6 pounds.

The color of his hands had become of a deep red, and this florid flush extended up the forearms, gradually diminishing in intensity. Let us add that, notwithstanding the vascular disturbance, there was no symptom which could be referred to the existence of scleroderma, to which there was some superficial resemblance.

The patient complained of great heat in the hands and forearms, and this increase of temperature was plainly perceptible to all who touched them; and it is a very remarkable fact that their sensibility was so greatly augmented that every thing he touched—instruments, wood, or paper—appeared to him cold as ice. He was troubled with formication in the forearms, which increased to a distressing degree when he rubbed his hands together, as in washing them.

Heat aggravated, and cold diminished the pain—facts of which he became aware from using cold and warm water.

As to the inferior extremities, they present different phenomena. There was, indeed, debility, as has been remarked, but the symptoms of the disease seem to have decussated. Thus, whilst the left arm was the weaker, the right leg was the more feeble. Instead of the hyperæsthesia which we observed in the hands, there was a notable loss of sensibility in the right foot, so that he did not feel the ground when walking. His foot seemed to him asleep or benumbed. There was at times slight formication in the right leg, but very little in the left. Nor was there a hyperthermal condition here, as in the upper extremities. Although the temperature of the soles of the feet seemed normal to himself during the day time, it had been remarked that when lying down and during the night they were icy cold to the touch.

In the lumbar region he had felt an intense itchiness, as though he had been beaten with nettles. This unpleasant sensation was not constant, and had only appeared five or six times in all, and then only in the morning and at night, when he was dressing or undressing and exposed to the cold air—phenomena occasionally found in the case of persons suffering from urticaria. There were no ridges or wheals perceptible.

It is highly interesting to note that when this urticaria made its appearance in the loins, the formication disappeared from the upper extremities.

As there was reason to suspect the existence of ocular troubles, we questioned his memory, and found that he had observed something like a mist before his eyes, especially at night. This disorder had, in fact, reached such a point in January last (1874) that he had given up attempting to read.

On his left eye-ball a harmless pterygium was remarked.

On applying the ophthalmoscope, Prof. Panas found that the fundus of the right eye was normal, whilst there was a very marked pathological excavation of the papilla of the left eye, the fundus of which was slightly congested.

Let us note, in conclusion, that during the continuance of his ailment he complained of great thirst, and of unusual drowsiness after meals.

Treatment.—Dr. Duchenne (de Boulogne) considered it proper, in this case, to try faradisation of the upper extremities, and this treatment was crowned with rapid and complete success. The patient remarked that he felt relief from the first application. After the seventh application, the following facts were established:

1st. The almost complete disappearance of the dark-red abnormal color, and the restoration of the natural temperature.

2d. The absence of the debility complained of, and the restoration of the muscular strength to nearly the normal standard.

Before the treatment he could not lift, at his best moments, a weight of four or five pounds without great effort, followed by extreme fatigue; he can now raise a considerable weight without experiencing any inconvenience. Tested by the dynamometer, the muscular force of his hands has increased by over four pounds.

The impotence, unusual thirst, and drowsiness after meals have disappeared, and his sight, although not yet perfect, has been so much improved that he can now read with comfort.

Etiology.—It was impossible to discover any fact in the patient's history to which we could with certainty attribute the origin of his disease. Nevertheless, it seemed to me not improbable that whilst working at his trade he might have been subjected to the influence of some kind of metallic poisoning, which acted on the nervous system, producing effects

not previously described. Suspecting this, and having discovered, during my microscopic investigations of the atmosphere, the presence of metals, in a finely divided state, in the air of various work-shops, I questioned him as to his occupation. In trimming copper, and removing any roughness there may chance to be present, much dust is caused, and he admitted having "swallowed" a quantity of it. Now, this dust, of which I obtained a specimen, contained the metal in a fine powder, which, when carried about by currents of air, would necessarily be drawn into the lungs.

It may be asked whether copper will affect the system in a manner such as that characteristic of this disease, or at all? Some authors—as, for instance, Doctors Boys de Lowry, A. Chevalier,* and Dr. de Pietra Santa†—have, indeed, denied the noxious influence of copper, even though the bones of operatives are known to become green-colored, owing to its absorption, a fact discovered from the *post mortem* examinations conducted at Durfort, Tarn. Blandet,‡ on the other hand, asserts that a metallic colic is the inevitable tribute paid to the influence of copper by all apprentices, and adds that adult workmen not seldom suffer from it themselves.

Becquerel, though at first disposed to admit the existence of a specific copper-colic, has since come to the conclusion that a true enteritis is produced, in which, among other symptoms, increased thirst is manifested, whilst the tongue may be normal, dry, or red. Three cases which came under his own observation had been evidently developed under the influence of copper-poisoning.§

Although these authors have not observed upon the exist-

* Chevalier.—*Notes sur les ouvriers qui travaillent le cuivre*. Annales d'Hygiène, t. XXXVII., p. 305.

† Pietra, Santa.—*Union Médicale*, 23d October, 1850.

‡ Blandet.—*Journal de Médecine de Trousseau*, March, 1845.

§ Becquerel.—*Traité d'Hygiène*, p. 940. 1873.

ence of any nervous symptoms, there can be no doubt that the nervous system is implicated when cases of copper-poisoning take place. Thus, at different stages, the patients suffer from violent headache, from a sense of constriction in the throat, an acrid taste in the mouth, a burning thirst, and severe cardialgia. It remains to be seen whether a more rigid investigation into the health of copper-workers would not result in discovering the occasional presence of symptoms such as those found in the case of our patient C., symptoms which might readily have been overlooked when colic and enteritis had shown themselves, for these are not only more disagreeable diseases, but also more easily diagnosed.

Theory—It is proper here to point out, in the first place, how closely the principal phenomena noted in this case harmonize with the data furnished by experimental physiology, and afterwards to examine whether we have not discovered some indications which may project light upon obscure points.

We know already that when the normal action of the sympathetic nerve has been interrupted, we should expect to find pathognomic phenomena beyond the lesion. A marked increase of the vascularity and temperature of the corresponding parts of the frame is manifested, exactly as we have seen it take place in our patient. Is this increase accompanied by formication? To such a question, experiments made upon animals can give no answer; but taking into consideration the statements made by our human patient, we should conclude that the existence of formication in animals thus treated is highly probable.

Presenting as they do identical phenomena of increased vascularity and augmented temperature, it seems of necessity to follow that they experience also a heightened sensibility and are affected by a like formication. This is a conclusion which experimental physiology may borrow from clinical observation, and it should accept it with the less hesitation

as it appears to be corroborated by an experiment of Dr. Samuel.* Having faradised the casserian ganglion in a rabbit, there were produced among other effects slight hyperæmia of the conjunctiva and an exaltation of sensibility so extreme that at the least touch of the eye-ball the animal was seized with general convulsions.

In the case of our patient, the contact and friction of the hands, even so slightly as in washing them, were enough to augment the sensibility to such an extent as to cause considerable distress. Like sufferings are felt when, owing to excessive reaction, there is a great afflux of blood to parts benumbed or frozen by intense cold. As regards our patient, the augmentation of temperature and of sensibility was so great as to render it painful for him to work at his trade, seeing that everything he touched, even wood and paper, gave him a sensation of icy coldness, and thus it became impossible to handle his tools without positive suffering. In a less robust individual the suffering would probably have manifested itself still more. The patient did not complain of any congestion of the conjunctiva, though some traces of it were perceptible; we could scarcely consider them, however, as of nervous origin. It is otherwise as regards the congestion of the fundus of the left eye, which seems attributable to the same cause as the peculiar debility noticeable in the left arm, although both hands were affected by the hyperæmia.

Dr. Raynaud has observed that the veins of the fundus oculi appeared a little more distended, and the capillary network a little more voluminous in rabbits, after he had severed the sympathetic at the neck. On subjecting the distal end to the action of electricity, he saw the central artery grow pale and almost entirely disappear.

But irritation produces a much greater effect, according to the experiments of Dr. Adamiuk, of Kazan, who writes, "I f

* S. Samuel—Die trophischen nerven, p. 61, 1860

taking an animal under the influence of curare (woorara), we irritate the sympathetic center of the spinal cord, on a level with the two inferior cervical vertebræ (Budge), and if, at the same time, we examine the eye with the ophthalmoscope, we shall recognize immediately in the vessels the same distribution of blood which we see in glaucoma—the veins are greatly distended and the arteries contracted.”* [We should in like manner expect to see, when the action of the sympathetic is interrupted, a hyperæmia produced by distension of the blood-vessels, consecutive on irritation of the dilator nerves.† Clinical observation appears to support here also the distinction laid down by MM. Claude Bernard, Brown Sequard, and Charcot, between the results resulting from a single section and those produced by an irritation of the nerve.]

Fever and simple paralysis of the muscular walls of the vessels explains to us neither the alterations of temperature and sensibility nor the ocular troubles of our patient. We are obliged to infer the existence of a central irritation of the dilator nerves, with a correlative exhaustion of energy in the constrictor nerves. But how shall we explain the success of the treatment upon this hypothesis? When without any lesion of the ganglionic system the anterior cornua of the spinal cord have undergone rapid change, as in the case of infantile myelitis, Dr. Duchenne (de Bologne) has found that the skin is discolored or cyanotic, the vessels being contracted, and the temperature lowered, whilst at the same time the muscles are atrophied. The heart-beats preserve

* Adamiuk—Étiologie du Glaucome, *Annales d'Oculistique*, t. lvi, p. 45, 1865.

† It is an error to say, as some have said, that the theory of dilator nerves has been abandoned by all but Dr. Duchenne (de Bologne). The eminent physiologist, Claude Bernard, sustained it with forcible arguments in his lectures delivered during the present season (1874) at the College de France.

their normal energy, the pulse is not enfeebled, but the impressive force of the blood suffices no longer to dilate the minute vessels. The dilator force, proceeding from the cerebro-spinal system, being destroyed, there is predominance of the constrictor force, coming from the (uninjured) ganglionic or great sympathetic system. Now the first effect of treatment by direct muscular faradisation in such a case should be rubefaction of the skin, followed by elevation of temperature and augmentation of sensibility.

If that be so, how comes it that in a case of hyperæmia faradisation can bring about a cure, which depends upon a diminution of the temperature, redness, and sensibility?

First, admitting, for the moment, that the theory of blood stasis propounded by Doctors Brown-Sequard and Waller be correct, then it would follow that faradisation, that is to say, that the cause which would produce the paralysis of the muscular walls would also cure it, which is absurd. Now, the cure itself is an established fact, and the cause of the apparent contradiction is not very difficult to explain if it be conceded that we have to deal with two distinct nervous systems.

When describing the effects produced by faradisation, such as rubefaction, Dr. Duchenne (de Boulogne) put the following question: "Why do not the vaso-motor constrictors, which topical faradisation ought to influence, when it influences the vaso-motor dilators, produce constriction of the vessels at this time? I confess that at present I do not know the reason. I confine myself to stating the fact."* Taught by the phenomena observed in our patient suffering from hyperæmia, we may suppose that in cases of infantile myelitis, characterized by ischæmia as described, the ganglionic system then exerts its constrictor power to the utmost, not being moderated by the action of the suffering cerebro-spinal system.

* Duchenne (de Boulogne) *De l'électrisation localisée*, p. 157. 1872.

In that case the electric excitation, which no longer acted on this nervous system, then at its highest tension (so to speak), passed altogether (by direct or reflex action) to influence the cerebro-spinal system and increase its dilator force, so that, thanks to its assistance, equilibrium was restored and even a reaction produced.

The phenomena observed in the case of the patient C—— may be explained in a similar manner. Here the pathogenic irritation lies in the cerebro-spinal system, the action of the sympathetic suffering in some way is partially abolished, and its constrictor force arrested. The dilator force of the complementary system is, consequently, free to exert itself to the utmost, and the result is that augmentation of vascularity, temperature, and sensibility, which we have seen. Then the faradaic excitation must pass over that system, which is at its highest tension, so that all its force goes to influence the ailing ganglionic system, and the equilibrium is again restored.

That the electric stimulus should produce a greater effect upon an unsound than upon a healthy system is, besides, no more than we ought to expect, judging from the general facts, of its therapeutical action.

As Professor Schiff affirms that alterations in nutrition take place readily, and develop rapidly in regions which have become hyperæmic, and as this opinion has been contradicted by Professor Virchow and other observers, it will not be without interest to notice that an inflammatory lesion showed itself in one of our patient's fingers when he was almost cured. The inflammation affected a joint of the left fore finger, the same which was marked by a whitlow scar, so that there was local debility. This tends to confirm, so far as it goes, the view taken by Dr. Claude Bernard, who holds that such lesions take place under conditions of local enfeeblement.

The inflammation referred to, it may be remarked, passed off without giving any trouble.

The phenomena observed in the inferior extremities demand our attention also. They were the converse of those seen in the upper extremities. The lowering of the temperature, and the diminution of the sensibility described, combine, with the impotence of which the patient complain, to indicate a lesion the converse of that which we have been studying.

The "erector-nerves" of Eckhardt are acknowledged to be dilator-nerves, the existence of which in the abdominal region has been established by Dr. Claude Bernard.

The objections raised by some to the existence of dilator nerves can not apply here, and if there was no hyperamia in this region it was obviously not for want of a dilator apparatus. Since, therefore, the means of action were not deficient, it seems to me that we must attribute the ischaemia, anaesthesia, and lowering of the temperature, to compensating effect of remote action, an exhaustion in the inferior nerve-region being correlated with, and compensatory to, the abnormal excitement in the superior, and *vice versa*. Clinical facts prove the probability of this view in attesting the existence of complementary alternations.

Thus, in certain diseases of the nervous system, ischaemia has been observed to follow hyperamia, and hyperamia to be consecutive on ischaemia, as atony follows spasm. Hence, when we see hyperamia and ischaemia produced at the same time, there is reason to believe that one is the complementary result of the cause which produces the other.* From these data it seems to follow that we should recognise the possible existence of similar troubles elsewhere than in the

* The hemi-anaesthesia of hysteria offers in this relation very important phenomena. Half the body (vertically) is smitten with palor and coldness, united with an ischaemia more or less permanent. Now Professor Charcot has demonstrated that a most remarkable relation exists between this hemi-anaesthesia and ovarian hyperaesthesia. [CHARCOT.—*Leçons*, p. 209, 1872, 1873.]

exterior of the body. Since they have been observed in the interior of the eye, why may they not exist in the heart, for instance, or other internal organs, either in alternation or simultaneously with external manifestations, or be altogether internal? * A correct diagnosis and accurate investigation yet remains to be made of those obscure, uneasy sensations, dull pains, flushes of heat, chill shivers, vague feelings of oppression, and other disorders which many invalids experience.

Dr. Raynaud has observed a case where coldness and cyanosis of the extremities, on the one hand, and ocular troubles on the other, alternated during several months. He states, also, that a patient who had cold hands, with numbness and cyanosis, complained of uneasiness in the precordial region. "The patient," he remarks with seeming incredulity, "professes to have felt, during a couple of months, a little oppression in the precordial region. A careful examination of the heart gives absolutely negative results."

The ophthalmoscope exists, but the cardiascope has not yet been discovered. It is, however, logical to believe that a transient and non-inflammatory hyperæmia may exist. It should be suspected, for instance, and studiously sought after in cases of alleged oppression, and in cases of nervous palpitation, where there is a sensation of precordial uneasiness, with faintness and syncope—remote results. †

* The preceding note confirms this view, as it shows hyperæsthesia of an internal organ, correlated with external anæsthesia.

† The phenomena of cerebro-cardiac neurosis described by Dr. Kriszhaber, a Hungarian physician, offer some analogies with those mentioned. In his writings, which may be consulted with advantage, he classifies the symptoms of this disease under four heads: first, disorders of the senses; second, of locomotion; third, of the circulation; and fourth, secondary troubles. To the first group belong false or prevented conceptions, and hyperæsthesia of the senses. The second includes giddiness and vertigo, causing abolition of the sense of equilibrium or balance power. This may

Where exanthemata threaten, we often find, as in febrile urticaria, the disease ushered in by shivering, nausea, cough, and fainting-fits. These symptoms usually vanish when the eruption makes its appearance on the surface of the body. Such phenomena caused Trousseau to admit the possible existence upon the bronchial mucous-membrane of an eruption analogous to that which afterwards shows itself upon the skin. Finally, the recognized existence of hyperæmia in several organs should dispel objections and stimulate to further investigation.

It is manifest that in the present state of science, no final judgment can be pronounced upon the hypothesis which we have been discussing. The time has not yet come. But it appeared to us that there were space, opportunity, and need for an effort in this direction, and we believe that, in any case, the assemblage and bearings of the facts here set forth open new horizons to pathological science, and promise an abundant harvest to those observers who shall consent to engage in this order of research.

be followed by paresis, made known by a feeling of lassitude or exhaustion, by involuntary movements, or by paraplegia. Disorders of the circulation consist chiefly in an irritable state of the vascular system, such that the least movement, as the act of sitting up in bed, or rising from a chair, may quicken the pulse by twenty, thirty, or even forty beats a minute. A person may be seized in the midst of his business, without any fore-warning, by a peculiar feeling in the head, as of a flash or an ascending wave, then instantly follow a deadening of sensation, humming in the ears, flashes of light in the eyes, or photopsys, and at the same time a sensation of anxiety and anguish in the region of the heart, accompanied by palpitations, extreme uneasiness, and a general impressionability or "nervous" state. Simultaneously, or a few moments after, vertigoes may occur, and titubation or staggering, and some times paraplegia. But it happens also that instead of being paralyzed, the patient experiences an extreme agitation, which impels him to walk about in spite of himself. Some times swoonings and syncope are observed to take place at the same time. These fits tend to recur, with diminishing intervals. KRISHABER.—*De la neuropathie—Cardiac.*

